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David B. Bice
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2CAN050903

May 12, 2009

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Licensee Event Report 50-368/2009-001-00
Arkansas Nuclear One – Unit 2
Docket Nos. 50-368
License Nos. NPF-6

Dear Sir or Madam:

In accordance with 10 CFR 50.73(a)(2)(iv)(A), enclosed is the subject report concerning a manual reactor trip from power.

There are no new commitments contained in this submittal.

Sincerely,

DBB/dce
Enclosure

cc: Mr. Elmo Collins
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

NRC Senior Resident Inspector
Arkansas Nuclear One
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London, AR 72847

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NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 8/31/2010

Estimated burden per response to comply with this mandatory information collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE Manual Reactor Trip from Power In Response To Feedwater Regulating Valve Failing Closed

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	13	2009	2009	- 001 -	00	05	12	2009	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

10. POWER LEVEL

84%

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☒ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER- Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
David B. Bice, Acting Manager, Licensing	479-858-5338

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	JB	LCV	F130	N					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On Friday, March 13, 2009, at approximately 21:51 CDT, Arkansas Nuclear One, Unit 2 was manually tripped from 84% power due to decreasing level in the "B" Steam Generator caused by the "B" Main Feedwater Regulating Valve moving in the closed direction without input demand to close. The trip was manually initiated at approximately the 25% Steam Generator water level. Due to the valve malfunction the system was unable to restore the Steam Generator water level before the 22.2% Emergency Feedwater System Control actuation set point was reached. The Emergency Feedwater System actuated, as designed, restoring Steam Generator water levels to normal. Post trip responses were normal with all plant safety systems functioning as expected. Investigation revealed that the most probable root cause of the event was a foreign substance in the clearance area of the armature, internal to a current-to-pressure (I/P) converter in the "B" Main Feedwater Regulating Valve positioner. The positioner was replaced and tested, and Unit 2 returned to 100% power operation, Mode 1, at 17:01 CDT on March 17, 2009.

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NARRATIVE

A. Plant Status

At the time of the occurrence of this event, Arkansas Nuclear One, Unit 2 (ANO-2) was operating at 84% power following the securing of the "A" Main Feedwater Pump (MFWP) [SJ] due to bearing degradation.

B. Event Description

On March 13, 2009, at 19:18 CDT, the "A" MFWP outboard thrust bearing temperature detector began trending upward. Following a verification of the elevated bearing temperature, the "A" MFWP was removed from service at 19:34 CDT. The Feedwater Control System (FWCS) [JB] responded as designed to the loss of the "A" MFWP by increasing the "B" MFWP speed and modulating open the "B" Main Feedwater Regulating Valve (MFRV). Control room operators commenced a power reduction to 84%. During this period, "B" MFRV began ramping closed. Upon detecting this abnormal condition the control board operator took the valve control to manual, inserting a full open demand signal. The valve was non-responsive to this action and continued to move in the closed direction resulting in the water level in the "B" Steam Generator reaching approximately 25%. At 21:51 CDT, operators manually tripped the reactor. Although the FWCS entered the Reactor Tripped Override (RTO) mode, it was unable to reposition either the MFRVs or the Main Feedwater Regulating Bypass Valves due to the system being in manual control mode. Therefore, the "B" MFWP was manually tripped at 21:55 CDT. The Emergency Feedwater (EFW) System actuated as designed and restored normal level in the Steam Generators.

The positioner was replaced and Unit 2 returned to 100% power operation, Mode 1, at 17:01 CDT on March 17, 2009.

C. Root Cause

Investigation revealed that a valve positioner for the "B" MFRV had failed causing the valve to be driven in the closed direction.

The MFRVs are controlled by Fisher Controls DVC6000 Series positioners. An integral part of the valve positioner is a current-to-pressure (I/P) converter that transforms an electrical signal to a pneumatic signal between the electronic control system and the air operated valve. The I/P converter was found to be sticking. Although a definitive Root Cause has not been found, the vendor believes that the condition was caused by a foreign substance in the clearance area of the armature, internal to the I/P converter.

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NARRATIVE

D. Corrective Actions

Immediate corrective actions included the replacement and diagnostic testing of the positioner, and particulate and moisture testing of the air supply to the valve.

E. Safety Significance

All safety systems were available and performed as designed. There was no radiological release to the public and the event presented no equipment safety or industrial safety issues. The Safety Significance of this event is low.

F. Basis for Reportability

A manual reactor trip from power in response to actual plant conditions is reportable pursuant to 10 CFR 50.73(a)(2)(iv)(A).

G. Additional Information

There were no previous similar events reported as Licensee Event Reports by ANO.

Energy Industry Identification System (EIIS) codes are identified in the test as [XX].